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Since 1975, Energy Control Systems has designed and installed building automation systems that provide climate-controlled energy conservation to help you reduce the cost of heating, cooling and lighting your facility. Whether you need a system to handle a small freestanding building or a total solution for a complex, multi-building property, we have the experience and product range to meet your needs.

We design a building automation system to meet your specific needs, then manufacture, install and service it to deliver exceptional return on investment (ROI). By conserving and using energy efficiently, our system solutions literally pay for themselves by providing energy conservation through comfort control.

Imagine, for a moment, what the grid of the not-too-distant future looks like. Should current trends continue, you"ll likely notice more electric vehicles gliding silently through the streets. You may see more buildings in your neighborhood topped with a solar array, many of them backed up with energy storage. Want hot water or cool air? There"s a good chance those appliances are powered by electrons instead of liquid fuels. Across the board, smart distributed energy resources (DERs) are becoming ubiquitous.

This is not today"s reality for most people, but momentum toward this imagined electric future is hard to ignore, which begs questions like: How do we smooth out the transition to a more decentralized grid with potentially millions of controllable assets? How can electrical systems of all scales-from individual buildings to regional grids-be optimized to handle more capacity?

One of the biggest pieces to the puzzle will be power control systems (PCS) capable of monitoring and controlling both sources and loads in real-time. Right now, there is no formal UL listing for PCS, only a limited "certification requirement decision" (CRD) looped into a separate standard. But that"s about to change with the release of the new UL 3141 standard, as we will explain in this article.

A PCS is a system-not necessarily a singular device-designed to maintain safe levels of current and loading on busbars. The system consists of a controller plus sensors and a method of communication between the controllable loads and sources. In many cases, the PCS will be its own product. In some cases, the PCS is integrated within an inverter.

Current transformers (CTs) monitor current at the aggregation panel and the main service panel. Communication cables connect the controller to the CTs and all inverters. When the CTs sense that a busbar is approaching overload, they send signals to throttle down the PV or ESS inverters.

A power control system (PCS) shall be listed and evaluated to control the output of one or more power production sources, energy storage systems (ESS), and other equipment. The PCS shall limit current and loading on the busbars and conductors supplied by the PCS.

For the circuits connected to a PCS, the PCS shall limit the current to the ampacity of the conductors or the ratings of the busbars to which it is connected in accordance with 705.13(A) through (E).

Subsections (A) through (E) go on to detail monitoring, overcurrent protection, and settings restrictions requirements. Most notably, access to the PCS settings is restricted to "qualified personnel" for security purposes. While not explicitly spelled out in the Code, in practice, this means settings will be configured and locked in at commissioning. Adjusting settings post-commissioning will often involve support from the manufacturer.

The 2023 NEC introduced new language to Section 705.13, replacing "power control system" with "energy management system" (EMS), a term that has been long defined in Code in Article 750. The key distinction between a PCS and EMS is that a PCS is programmed to optimize safety and performance, whereas an EMS was historically programmed to optimize economic outcomes. A PCS would adjust inverter output to limit overloading busbars; an EMS would adjust inverter output to maximize ROI through utility time-of-use rates. An EMS with PCS would perform both functions.

An EMS in accordance with 750.30 shall be permitted to limit current and loading on the busbars and conductors supplied by the output of one or more interconnected electric power production or energy storage sources.